

Application No. 09/623,427

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Amendments to the Claims:

The following claims will replace all prior versions of the claims in this application (in the unlikely event that no claims follow herein, the previously pending claims will remain):

1. (Currently amended) Water-soluble packaging film which is soluble in water at temperatures between 5 and 35°C comprising at least one polyurethane polymer, which at least one polyurethane polymer comprises:

2 to 35 weight %, based on the weight of polyurethane polymer, of poly(ethylene oxide) groups which have a chain length(s) corresponding to a number average molecular weight within the range of from 300 to 3,000 Daltons;

15 to 150 millequivalents, per 100g of polyurethane polymer, of acid-functional groups; and wherein

at least 50 weight% of the acid-functional groups are neutralised, such neutralisation being with at least one base, at least part of which is at least one non-volatile base;

and said at least one polyurethane polymer is a chain extended product formed using:

(A) a prepolymer component comprising an isocyanate-terminated polyurethane prepolymer, said component being formed from reactants which comprise:

- (i) at least one organic polyisocyanate,
- (ii) at least one isocyanate-reactive compound providing said poly(ethylene oxide) groups in the resulting polyurethane polymer, and
- (iii) at least one isocyanate-reactive compound providing said acid-functional groups in the resulting polyurethane polymer, and

(B) an active hydrogen component comprising at least one active hydrogen chain-extending compound.

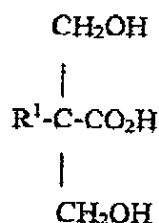
2. (Previously amended) Film according to claim 1 wherein the amount of said poly(ethylene oxide) groups is within the range of 2 to 20 weight % based on the weight of the polyurethane polymer.

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3. (Previously amended) Film according to claim 1 wherein the amount of said poly(ethylene oxide) groups is within the range of 5 to 35 weight % based on the weight of the polyurethane polymer.
4. (Previously amended) Film according to claim 1 wherein said poly(ethylene oxide) groups have a chain length corresponding to a number average molecular weight within the range of from 500 to 2000 Daltons.
5. (Previously amended) Film according to claim 1 wherein said poly(ethylene oxide) groups are at least in-chain in the polyurethane polymer.
6. (Previously amended) Film according to claim 5 wherein the isocyanate-reactive compound providing in-chain poly(ethylene oxide) groups is a poly(ethylene glycol).
7. (Previously amended) Film according to claim 1 wherein the amount of acid functional groups present in the polyurethane polymer provides 30 to 125 millequivalents of such groups per 100g of polyurethane polymer.
8. (Previously amended) Film according to claim 1 wherein said acid functional groups are carboxylic acid or sulphonic acid groups.
9. (Previously amended) Film according to claim 8 wherein the isocyanate-reactive compound providing acid functional groups is a dihydroxyalkanoic acid of formula



where R^1 is hydrogen or alkyl.

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10. (Previously amended) Film according to claim 9 where said isocyanate-reactive compound is 2,2-dimethylol propionic acid (DMPA).
11. (Previously amended) Film according to claim 8 wherein the isocyanate-reactive compound providing acid functional groups is a diol bearing a sulphonic acid alkali metal salt.
12. (Previously amended) Film according to claim 1 wherein the reactants for forming the prepolymer component (A) include at least one isocyanate-reactive compound which is monofunctional with regard to isocyanate-reactive functionality and acts as a chain-terminating material for the prepolymer.
13. (Previously amended) Film according to claim 1 wherein said polyurethane polymer optionally incorporates poly(propylene oxide) groups.
14. (Previously amended) Film according to claim 1 wherein said active hydrogen component (B) comprises at least one active hydrogen chain-extending compound provided by the reaction of water with said prepolymer.
15. (Previously amended) Film according to claim 1 wherein said active hydrogen component (B) comprises an added active hydrogen chain-extending compound.
16. (Previously amended) Film according to claim 15, wherein said added active-hydrogen chain extending compound is selected from the group consisting of a primary or secondary aliphatic, alicyclic, aromatic, araliphatic or heterocyclic polyamine, hydrazine (including its monohydrate) and a substituted hydrazine.
17. (Original) Film according to claim 16 wherein said added active hydrogen chain-extending compound is hydrazine or hydrazine monohydrate.

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18. (Previously amended) Film according to claim 1 wherein at least 90 weight% of the acid functional groups in the polyurethane polymer are neutralised.
19. (Previously amended) Film according to claim 1 wherein at least 50 weight % of the at least one base used for neutralisation is selected from the group consisting of Group IA monovalent metal bases or basic salts, triethanolamine, 2-methyl-2-amino-1-propanol, and quaternary ammonium hydroxides.
20. (Previously amended) Film according to claim 19 wherein said base is selected from the group consisting of NaOH, KOH and LiOH.
21. (Original) Film according to either claim 19 or claim 20 wherein the amount of base used provides an excess of base required for the neutralisation of all the acid groups, the amount of excess base remaining after neutralisation being up to 10 weight % based on the weight of the film.
22. (Previously amended) Film according to claim 1 wherein the polymeric material thereof further comprises at least one other polymer which is other than a polyurethane and does not detract from the water-solubility of the film.
23. (Previously amended) Film according to claim 22 wherein said at least one other polymer is selected from the group consisting of polyvinyl alcohol and neutralised carboxylic acid- or sulphonic acid-functional vinyl polymer.
- 24-49. (Cancelled).
50. (Previously presented) Water-soluble packaging comprising an enveloping film which is soluble in water at temperatures between 5 and 35°C, said enveloping film comprising at least one polyurethane polymer, which at least one polyurethane polymer comprises:

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2 to 35 weight %, based on the weight of polyurethane polymer, of poly(ethylene oxide) groups which have a chain length(s) corresponding to a number average molecular weight within the range of from 300 to 3,000 Daltons;

15 to 150 millequivalents, per 100g of polyurethane polymer, of acid-functional groups; and wherein

at least 50 weight% of the acid-functional groups are neutralised, such neutralisation being with at least one base, at least part of which is at least one non-volatile base;

and said at least one polyurethane polymer is a chain extended product formed using:

- (A) a prepolymer component comprising an isocyanate-terminated polyurethane prepolymer, said component being formed from reactants which comprise:
 - (i) at least one organic polyisocyanate,
 - (ii) at least one isocyanate-reactive compound providing said poly(ethylene oxide) groups in the resulting polyurethane polymer, and
 - (iii) at least one isocyanate-reactive compound providing said acid-functional groups in the resulting polyurethane polymer, and
- (B) an active hydrogen component comprising at least one active hydrogen chain-extending compound.

51. (Previously presented) Water-soluble packaging according to claim 50, in the form of a sachet, capsule or bag.

52. (Previously presented) Water-soluble packaging according to claim 50, wherein said enveloping film has a monolayer construction.

53. (Previously presented) Water-soluble packaging according to claim 50, wherein said enveloping film has a laminate construction.

54. (Previously presented) A combination of water-soluble packaging and a material packaged therein, wherein said water-soluble packaging comprises the water-soluble packaging according to claim 50.

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55. (Previously presented) A method for packaging a material comprising inserting the material in the water-soluble packaging according to claim 50.

56. (New) Film according to claim 50 wherein the amount of said poly(ethylene oxide) groups is within the range of 2 to 20 weight % based on the weight of the polyurethane polymer.

57. (New) Film according to claim 50 wherein the amount of said poly(ethylene oxide) groups is within the range of 5 to 35 weight % based on the weight of the polyurethane polymer.

58. (New) Film according to claim 50 wherein said poly(ethylene oxide) groups have a chain length corresponding to a number average molecular weight within the range of from 500 to 2000 Daltons.

59. (New) Film according to claim 50 wherein said poly(ethylene oxide) groups are at least in-chain in the polyurethane polymer.

60. (New) Film according to claim 59 wherein the isocyanate-reactive compound providing in-chain poly(ethylene oxide) groups is a poly(ethylene glycol).

61. (New) Film according to claim 50 wherein the amount of acid functional groups present in the polyurethane polymer provides 30 to 125 millequivalents of such groups per 100g of polyurethane polymer.

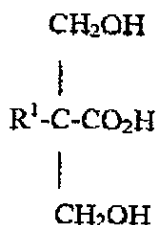
62. (New) Film according to claim 50 wherein said acid functional groups are carboxylic acid or sulphonic acid groups.

63. (New) Film according to claim 62 wherein the isocyanate-reactive compound providing acid functional groups is a dihydroxyalkanoic acid of formula

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where R¹ is hydrogen or alkyl.

64. (New) Film according to claim 63 where said isocyanate-reactive compound is 2,2-dimethylol propionic acid (DMPA).
65. (New) Film according to claim 62 wherein the isocyanate-reactive compound providing acid functional groups is a diol bearing a sulphonic acid alkali metal salt.
66. (New) Film according to claim 50 wherein the reactants for forming the prepolymer component (A) include at least one isocyanate-reactive compound which is monofunctional with regard to isocyanate-reactive functionality and acts as a chain-terminating material for the prepolymer.
67. (New) Film according to claim 50 wherein said polyurethane polymer optionally incorporates poly(propylene oxide) groups.
68. (New) Film according to claim 50 wherein said active hydrogen component (B) comprises at least one active hydrogen chain-extending compound provided by the reaction of water with said prepolymer.
69. (New) Film according to claim 50 wherein said active hydrogen component (B) comprises an added active hydrogen chain-extending compound.
70. (New) Film according to claim 69, wherein said added active-hydrogen chain extending compound is selected from the group consisting of a primary or secondary

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aliphatic, alicyclic, aromatic, araliphatic or heterocyclic polyamine, hydrazine (including its monohydrate) and a substituted hydrazine.

71. (New) Film according to claim 70 wherein said added active hydrogen chain-extending compound is hydrazine or hydrazine monohydrate.
72. (New) Film according to claim 50 wherein at least 90 weight% of the acid functional groups in the polyurethane polymer are neutralised.
73. (New) Film according to claim 50 wherein at least 50 weight % of the at least one base used for neutralisation is selected from the group consisting of Group IA monovalent metal bases or basic salts, triethanolamine, 2-methyl-2-amino-1-propanol, and quaternary ammonium hydroxides.
74. (New) Film according to claim 73 wherein said base is selected from the group consisting of NaOH, KOH and LiOH.
75. (New) Film according to either claim 73 or claim 74 wherein the amount of base used provides an excess of base required for the neutralisation of all the acid groups, the amount of excess base remaining after neutralisation being up to 10 weight % based on the weight of the film.
76. (New) Film according to claim 50 wherein the polymeric material thereof further comprises at least one other polymer which is other than a polyurethane and does not detract from the water-solubility of the film.
77. (New) Film according to claim 76 wherein said at least one other polymer is selected from the group consisting of polyvinyl alcohol and neutralised carboxylic acid- or sulphonic acid-functional vinyl polymer.